AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Previously Presented) A display apparatus comprising:

a display section having a plurality of lighting elements;

a vertical driving section operable to drive each row of the display section selectively;

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating various control data, and wherein the horizontal driving sections control lighting gradation based on the various control data by selecting the lighting elements of desired columns in a row selected by the vertical driving section; and

a driving control section having a first communicating section operable to communicate the various control data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections,

wherein:

the second communicating section transfers data packets having a control field including identification information, which is an ID to denote the horizontal driving sections to be transferred the various control data, control identification information to denote a type of the control data, and an information field including the control data to the horizontal driving sections; and

the horizontal driving communicating section receives the control data for the horizontal driving section, when the ID of identification information of the transferred data packet agrees

with ID stored in itself.

3. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein

each of the horizontal driving sections stores a common ID to be received commonly for all of the horizontal sections and the individual ID added individually to each of the horizontal sections as identification information to judge whether to perform a receiving process for the transferred data packet.

4. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein

each of the horizontal driving communicating sections has a receiving section performing a receiving process, and an output selecting circuit outputting the various control data input into the horizontal driving communicating section and data input from the receiving section selectively, outputs a control field of an input data packet transparently from the output selecting circuit, and outputs an information field with replacing for a predetermined data packet.

5. (Previously Presented) The display apparatus according to claim 4, wherein:

the predetermined data packet is a disturbance data reading packet having the identification information, the control field including control identification information denoting to read a disturbance data, and the information field including dummy data;

each of the horizontal driving communicating sections further has a disturbance data retaining section retaining the disturbance data and outputs the disturbance data retained in the disturbance data retaining section with replacing dummy data included in the control field of the disturbance data reading packet received in the receiving section of the horizontal driving section

with switching the output selecting circuit, when the identification information of the data packet received in the receiving section of the horizontal driving section agrees with its own individual ID and has the control identification information denoting control type to read a disturbance data; and

the driving control section reads the disturbance data of the disturbance reading packet transferred from the horizontal driving section.

6. (Previously Presented) The display apparatus according to claim 4, wherein:

the predetermined data packet is a communication check packet having the identification information, the control field including control identification information denoting a communication check, and the information field including a communication check data;

each of the horizontal driving communicating sections further has a data reversing section reversing data of the information field, and outputs data from the data reversing section with replacing the communication check data included in the information field of the communication check packet received in the receiving section of the horizontal driving section with switching the output selecting circuit, when the identification information of the data packet received in the receiving section of the horizontal driving section agrees with its own individual ID and has the control identification information denoting a control type of the communication check; and

the driving control section performs a disturbance check of a communication statement based on the data included in the information field of each communication check packet replied from each horizontal driving section and the communication check data of the communication check packet transferred to each horizontal driving section.

7. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein:

the horizontal driving communicating section of each of the horizontal driving sections can output only in one direction; and

the output data from the horizontal driving communicating section connected at an end position of the lowest stream in a data transferring direction in a plurality of the horizontal driving sections connected serially is input to the second communicating section of the driving control section.

8. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein:

the driving control section or the horizontal driving section has a first reference clock generating section generating a first reference clock to control lighting gradation; and

each of the horizontal driving sections further has a lighting control section controlling lighting gradation based on a reference clock, a second reference clock generating section generating a second reference clock synchronizing the various control data input from the driving control section, a reference clock selecting circuit, to which is input the first reference clock and the second reference clock, and selects the first reference clock or the second reference clock alternatively to output as the reference clock to control lighting gradation.

9. (Previously Presented) The display apparatus according to claim 8, wherein:

each of the horizontal driving sections further has a first counter counting an input of the first reference clock and generating a clear signal every predetermined count number;

a second counter counting an input of the second reference clock until being input the clear signal from the first counter; and

the reference clock selecting circuit selects the reference clock from the first reference clock to the second reference clock, when a count number of the second counter becomes higher than a predetermined value.

10. (Previously Presented) The display apparatus according to claim 5, wherein:

each of the horizontal driving sections has a third counter counting input of a first reference clock and retaining predetermined data when a count number of the input first reference data becomes a predetermined value, and clearing the count number of the first reference clock when the horizontal driving communicating section receives a frame start packet denoting frame synchronizing;

the disturbance data retaining section retains data denoting an occurrence of a disturbance of the first reference clock, when a count number of the third counter is less than the predetermined value; and

the driving control section reads the data denoting an occurrence of disturbance of the first reference clock by the disturbance data reading packet, controls the reference clock selecting circuit of the horizontal driving section occurring the disturbance to select from the first reference clock to the second reference clock by the data packet.

11. (Previously Presented) The display apparatus according to claim 10, wherein the predetermined value of the count number of the first reference clock is set based on indicating a gradation number of one frame.

12. (Currently Amended) The display apparatus according to claim 2 [[1]], further

comprising:

a substrate integrated with a lighting element board disposing the lighting elements and a driving circuit board having driving circuits driving the lighting elements, and

wherein the driving circuits are disposed between the lighting elements.

13. (Currently Amended) A display apparatus comprising:

a display section having a plurality of lighting elements;

a vertical driving section operable to drive ~~driving~~ each row of the display section selectively;

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating various control data, and wherein the horizontal driving sections control lighting gradation based on the various control data by selecting the lighting elements of desired columns in a row selected by the vertical driving section; and

a driving control section having a first communicating section operable to communicate the various data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections, wherein:

the horizontal driving sections are connected to each other by signal lines and can communicate the data with the driving control section;

the driving control section adds identification information to transferred control data to each horizontal driving section corresponding to a connecting formation of the horizontal driving sections in the display section and transfers various control data; ~~and~~

the horizontal driving sections perform a lighting control of the lighting elements;

the second communicating section transfers data packets having a control field including identification information, which is an ID to denote the horizontal driving sections to be transferred the various control data, control identification information to denote a type of the control data, and an information field including the control data to the horizontal driving sections; and

the horizontal driving communicating section receives the control data for the horizontal driving section, when the ID of identification information of the transferred data packet agrees with ID stored in itself.

14. (Previously Presented) The display apparatus according to claim 13, wherein:

the driving control section further has an identification information storing section storing IDs added to the horizontal driving sections according to an order to transfer the control data to the horizontal driving sections corresponding to a path of the signal lines connecting the horizontal driving sections to each other; and

the driving control section transfers the control data input from the external device with adding the IDs read from the identification information storing section corresponding to each horizontal driving section one after another to the horizontal driving sections in data packet format.

15. (Currently Amended) A display apparatus comprising:

a display section having a plurality of lighting elements;

a vertical driving section driving each row of the display section selectively;

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating various control data, and wherein the horizontal driving sections control lighting gradation based on the various control data by selecting the lighting elements of desired columns in a row selected by the vertical driving section; and

a driving control section having a first communicating section operable to communicate the various data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections, wherein:

each of the horizontal driving communicating sections of the horizontal driving sections has a horizontal driving side identification information storing section storing identifying ID denoting an ID of the horizontal driving section; ~~and~~

the identifying ID of each of the horizontal driving sections stored in the horizontal driving side identification information storing section is set to different identifying IDs from the horizontal driving section connected with the second communicating section side one after another based on a predetermined calculation;

the second communicating section transfers data packets having a control field including identification information, which is an ID to denote the horizontal driving sections to be transferred the various control data, control identification information to denote a type of the control data, and an information field including the control data to the horizontal driving sections; and

the horizontal driving communicating section receives the control data for the horizontal driving section, when the ID of identification information of the transferred data packet agrees

with ID stored in itself.

16. (Previously Presented) The display apparatus according to claim 15, wherein:

each of the horizontal driving communicating sections of the horizontal driving sections has a receiving section for inputting and outputting data, an output selecting circuit outputting data input to the horizontal driving section or the data output from the receiving section selectively;

when setting a command to set the ID of the horizontal driving section is input, the horizontal driving communicating sections control to switch the data output of the output selecting circuit from the data input to the horizontal driving section to the data output through the receiving section; and

to store the identifying ID input to the receiving section to the horizontal driving side identification information storing section and to output an identifying ID, which is performed the predetermined calculation against the identifying ID input to the receiving section from the output selecting circuit.

17. (Currently Amended) The display apparatus according to claim 15, wherein:

the horizontal driving communicating sections of the horizontal driving sections have a receiving section for inputting and outputting data, an output selecting circuit outputting data input to the horizontal driving section or the data output from the receiving section selectively;

when setting a command to set the ID of the horizontal driving section is input, the horizontal driving communicating sections controls to switch the data output of the output selecting circuit from the data input to the horizontal driving section ~~(3)~~ to the data output

through the receiving section; and

to store the identifying ID, which is performed the predetermined calculation against the identifying ID input to the receiving section, to the horizontal driving side identification information storing section and to the identifying ID performed the predetermined calculation from the output selecting circuit.

18. (Previously Presented) The display apparatus according to claim 15, wherein the horizontal driving communicating sections of the horizontal driving sections control to switch the data output of the output selecting circuit from the data through the receiving section to the data input to the horizontal driving section after outputting the identifying ID performed the predetermined calculation from the output selecting circuit.

19. (Previously Presented) The display apparatus according to claim 13, wherein:

the display section is constituted by a plurality of indicating blocks divided into m rows X n columns, wherein m, n are integers and two or more areas;

the horizontal driving sections are connected from the second communicating section side one after another in a horizontal direction serially; and

the horizontal driving section connected at an end column of the lowest stream in each row is connected with the horizontal driving section of a same column in a next row.

20. (Previously Presented) The display apparatus according to claim 13, wherein:

each of the horizontal driving sections judges whether to perform a receiving process against the transferred data packets based on the identification information added to the data

packets or not, by storing an individual ID, which is added to each horizontal driving section individually, to the horizontal driving side identification information storing section; and

the horizontal driving sections store a common ID to be received by all of the horizontal driving sections commonly.

21. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein a plurality of the lighting elements are disposed in a matrix shape in the display section.

22. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein the control data is image data for image-displaying.

23. (Currently Amended) The display apparatus according to claim 2 [[1]], wherein the control data is illuminating data for an illumination.

24. (Previously Presented) A display driving circuit driving a display apparatus, which has a display section having a plurality of lighting elements, comprising:

a vertical driving section driving each row of the display section selectively;

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating lighting data for lighting the lighting elements, performing light-driving based on the lighting data by selecting the lighting elements of desired columns in a row selected by the vertical driving section; and

a driving control section having a first communicating section operable to communicate the lighting data with an external device, and a second communicating section connected with a

plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections, wherein:

the horizontal driving sections have added IDs to discriminate themselves;

the second communicating section transfers data packets having a control field including identification information, which is the ID to discriminate the horizontal driving section to be transferred the lighting data, and control identification information to denote a type of the lighting data, and an information field including the lighting data to the horizontal driving sections; and

the horizontal driving communicating sections receive the lighting data for the horizontal driving sections, when the ID of identification information of the transferred data packet agrees with ID added to itself.

25. (Previously Presented) A display driving circuit driving a display apparatus, which has a display section having a plurality of lighting elements and a vertical driving section driving each row of the display section selectively, comprising:

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating lighting data for lighting the lighting elements, performing light-driving based on the lighting data by selecting the lighting elements of desired columns in a row selected by the vertical driving section; and

a driving control section having a first communicating section operable to communicate the lighting data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections, wherein:

the horizontal driving sections have added IDs to discriminate themselves;

the second communicating section transfers data packets having a control field including identification information, which is the ID to discriminate the horizontal driving sections to be transferred the lighting data, and control identification information to denote a type of the lighting data, and an information field including the lighting data to the horizontal driving sections; and

the horizontal driving communicating sections receive the lighting data for the horizontal driving sections, when the ID of identification information of the transferred data packet agrees with ID added to itself.

26. (Previously Presented) A display driving circuit driving a display apparatus, which has a display section having a plurality of lighting elements, a vertical driving section driving each row of the display section selectively, and a plurality of horizontal driving sections each having a horizontal driving communicating section communicating lighting data for lighting the lighting elements, performing light-driving based on the lighting data by selecting the lighting elements of desired columns in a row selected by the vertical driving section, comprising:

a driving control section having a first communicating section operable to communicate the lighting data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections, wherein:

the horizontal driving sections have added IDs to discriminate themselves;

the second communicating section transfers data packets having a control field including identification information, which is the ID to discriminate the horizontal driving sections to be

transferred the lighting data, and control identification information to denote a type of the lighting data, and an information field including the lighting data to the horizontal driving sections; and

the horizontal driving communicating section receives the lighting data for the horizontal driving sections, when the ID of identification information of the transferred data packet agrees with ID added to itself.

27-29. (Canceled)

30. (Currently Amended) A method for driving a display apparatus, which has a display section having a plurality of lighting elements, a vertical driving section driving each row of the display section selectively, and a plurality of horizontal driving sections, wherein each of the horizontal driving section has a horizontal driving communicating section communicating lighting data for lighting the lighting elements and performing light-driving based on the lighting data by selecting the lighting elements of desired columns in a row selected by the vertical driving section, wherein the horizontal driving sections are connected to each other by a signal line and can communicate the data with a driving control section, comprising:

storing, by the driving control section, IDs added to the horizontal driving section corresponding to a path of the signal line connecting the horizontal driving sections to each other;

adding, by the driving control section, IDs identifying the horizontal driving sections to the horizontal driving sections;

transferring, by the driving control section, the lighting data input from an external device

with adding the stored IDs corresponding to each horizontal driving section one after another to the horizontal driving sections in data packet format, wherein the data packet has a control field including identification information, which is an ID to denote the horizontal driving sections to be transferred the various control data, control identification information to denote a type of the control data, and an information field including the control data to the horizontal driving sections; and

receiving, by the horizontal driving sections, the data packet for itself, performing a predetermined process, and then transferring the data to the horizontal driving section connected next or the driving control section.

31. (Previously Presented) A driving circuit of an image display apparatus comprising:

a display section having a plurality of lighting elements in a matrix shape;

a vertical driving section driving each row of the display section selectively;

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating various control data including image data, and wherein the horizontal driving sections control lighting gradation based on the various control data by selecting the lighting elements of desired columns in a row selected by the vertical driving section;

a driving control section having a first communicating section operable to communicate the various data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections;

wherein the second communicating section transfers data packets having a control field

including identification information, which is the ID to denote the horizontal driving sections to be transferred the various control data, and control identification information to denote a type of the control data, and an information field including the control data to the horizontal driving sections, and

wherein the horizontal driving communicating section receives the control data for the horizontal driving sections, when the ID of identification information of the transferred data packet agrees with ID stored therein.

32. (Currently Amended) A driving circuit of an image display apparatus comprising:

a display section having a plurality of lighting elements in a matrix shape;

a vertical driving section driving each row of the display section selectively;

a plurality of horizontal driving sections, wherein each of the horizontal driving sections has a horizontal driving communicating section communicating various control data including image data, and wherein the horizontal driving sections control lighting gradation based on the various control data by selecting the lighting elements of desired columns in a row selected by the vertical driving section;

a driving control section having a first communicating section operable to communicate the various data with an external device, and a second communicating section connected with a plurality of the horizontal driving sections serially, wherein the driving control section controls the vertical driving section and the horizontal driving sections,

wherein the horizontal driving sections are connected to each other by a signal line and can communicate the data with the driving control section,

wherein the driving control section adds identification information to transferred control

data to each horizontal driving section corresponding to a connecting formation of the horizontal driving sections in the display section and transfers the various control data,

wherein the horizontal driving sections perform lighting control of the lighting elements,

wherein the driving control section further has an identification information storing section storing IDs added to the horizontal driving section according to an order to transfer the control data to the horizontal driving section corresponding to a path of the signal line connecting the horizontal driving sections to each other, ~~and~~

wherein the driving control section transfers the control data input from the external device with adding the IDs read from the identification information storing section corresponding to each horizontal driving section one after another to the horizontal driving sections in data packet format, and

wherein the data packet has a control field including identification information, which is an ID to denote the horizontal driving sections to be transferred the various control data, control identification information to denote a type of the control data, and an information field including the control data to the horizontal driving sections.